CLAIMS

What is claimed is:

1. An integrated dispersion compensator planar lightwave circuit, comprising:

an input for receiving a fiber optic signal;

a Fourier filter coupled to receive the signal, the filter configured to add a phase compensation to the signal to correct a chromatic dispersion of the signal; and

an output coupled to transmit the dispersion compensated signal from the Fourier filter.

2. The planar lightwave circuit of claim 1 wherein the Fourier filter is implemented using a tap delay filter.

3. The planar lightwave circuit of claim 2 wherein the tap delay filter includes a plurality of delay lines for implementing the phase compensation for the signal.

4. The planar lightwave circuit of claim 2 wherein the tap delay filter includes a plurality of delay lines for implementing the phase compensation for the signal and wherein the delay lines are implemented using Mach Zehnder couplers.

5. The planar lightwave circuit of claim 4 wherein the Mach Zehnder couplers are configured to distribute power from signal between the delay

lines and to recombine the power from the delay lines to generate the dispersion compensated signal.

6. The planar lightwave circuit of claim 4 wherein a plurality of thermal optic phase shifters coupled to the delay lines are used to generate the phase compensation.

7. A planar lightwave circuit having an integrated dispersion compensator, comprising:

an input for receiving a fiber optic signal;

a tap delay filter coupled to receive the signal, the filter configured to add a phase compensation to the signal to correct a chromatic dispersion of the signal; and

an output coupled to transmit the dispersion compensated signal from the filter.

8. The planar lightwave circuit of claim 7 wherein the tap delay filter includes a plurality of thermal optic phase shifters for implementing the phase compensation.

9. The planar lightwave circuit of claim 7 wherein the tap delay filter includes a plurality of delay lines, each of the delay lines including at least one thermal optic phase shifter for implementing the phase compensation for the signal.

10. The planar lightwave circuit of claim 9 wherein a plurality of Mach Zehnder couplers are used to distribute power from the signal to the delay lines.

11. The planar lightwave circuit of claim 10 wherein the Mach Zehnder couplers are configured to distribute power from signal between the delay lines and to recombine the power from the delay lines to generate the dispersion compensated signal.

12. The planar lightwave circuit of claim 7 wherein the tap delay filter includes a number of delay lines, the number of delay lines determining a spectral range of the filter.

13. An arrayed waveguide grating planar lightwave circuit having an integrated dispersion compensator, comprising:

an input for receiving a fiber optic signal;

a Fourier filter coupled to receive the signal, the filter configured to add a phase compensation to the signal to correct a chromatic dispersion of the signal; and

an output coupled to transmit the dispersion compensated signal from the Fourier filter to an arrayed waveguide grating.

14. The planar lightwave circuit of claim 13 wherein the Fourier filter is implemented using a tap delay filter.

15. The planar lightwave circuit of claim 14 wherein the tap delay filter includes a plurality of delay lines for implementing the phase compensation for the signal.

16. The planar lightwave circuit of claim 14 wherein the tap delay filter includes a plurality of delay lines for implementing the phase compensation for the signal and wherein the delay lines are implemented using Mach Zehnder couplers.

17. The planar lightwave circuit of claim 16 wherein the Mach Zehnder couplers are configured to distribute power from signal between the delay lines and to recombine the power from the delay lines to generate the dispersion compensated signal.

18. The planar lightwave circuit of claim 16 wherein a plurality of thermal optic phase shifters coupled to the delay lines are used to generate the phase compensation.